

WHAT IS CLAIMED IS:

1. A charging apparatus that charges with voltage from an alternating current bicycle dynamo, wherein the charging apparatus comprises:
 - a rectifying circuit for rectifying the alternating current from the bicycle dynamo;
 - a full-wave charging element operatively coupled to the rectifying circuit for charging during both positive and negative half-cycles of the bicycle dynamo;
 - a first half-wave charging element operatively coupled to the rectifying circuit in parallel with the full-wave charging element, wherein the first half-wave charging element charges during positive half-cycles of said dynamo; and
 - a second half-wave charging element operatively coupled to the rectifying circuit in parallel with the full-wave charging element, wherein the second half-wave charging element charges during negative half-cycles of the dynamo.
2. The charging apparatus according to claim 1 wherein the full-wave charging element comprises a secondary cell.
3. The charging apparatus according to claim 1 wherein the first half-wave charging element is connected in series with the second half-wave charging element.
4. The charging apparatus according to claim 1 wherein the full-wave charging element comprises an electric double layer capacitor.
5. The charging apparatus according to claim 4 wherein the first half-wave charging element comprises a first electrolytic capacitor.
6. The charging apparatus according to claim 5 wherein the second half-wave charging element comprises a second electrolytic capacitor.
7. The charging apparatus according to claim 6 wherein the first electrolytic capacitor is connected in series with the second electrolytic capacitor.

8. The charging apparatus according to claim 1 wherein the first half-wave charging element comprises a first electrolytic capacitor.

9. The charging apparatus according to claim 8 wherein the second half-wave charging element comprises a second electrolytic capacitor.

10. The charging apparatus according to claim 9 wherein the first electrolytic capacitor is connected in series with the second electrolytic capacitor.